

Application No. 09/09/746,774

REMARKS

ELECTION/RESTRICTIONS

Applicant's election of Species I and A in Paper No. 5 was acknowledged.

OBJECTION TO THE DRAWINGS

The drawings have been objected to since the limitations of Claims 4 and 20 are allegedly not shown.

In response, Figure 5 has been amended to show a testing fixture, thereby showing the limitation expressed in claim 4. Also, as discussed below, a sentence has been inserted at page 10, line 21 of the Specification referring to the testing fixture in the amended drawing. This sentence in the Specification is added to one of the paragraphs of the Specification as originally filed that discussed electrical and functional testing prior to separation of the common substrate, all as claimed within claim 4. No new matter is added.

With respect to the objection to the drawings in relation to Claim 20, Applicant points out that original Figure 8 shows a connection external from the holding fixture. Each of the limitations of Claim 20 are therefore already in the drawings, and no amendment to the drawings seems warranted for this objection.

For the Examiner's convenience, an amended drawing has been sent to the Official Draftsperson.

OBJECTION TO THE SPECIFICATION

The Abstract has been objected to because the Abstract did not sufficiently describe the improved process for manufacture and assembly of a plurality of adjoining printed wiring boards. In response, a new Abstract has been submitted as part of this Amendment.

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CLAIM REJECTIONS – 35 U.S.C. §112

Claims 2-5, 7-11 and 14-20 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Applicant quite frankly does not understand this objection. The only example given is claim 2, where a new claim element is introduced. As a new claim element, no antecedent basis for that element is required or even possible. In an attempt to understand the rejection, Applicant has unsuccessfully attempted to reach the Examiner by telephone. In the absence of further information regarding the specific objections to the enumerated Claims, Applicant is unable to respond fully to this rejection.

Regardless, Applicant has amended each of Claims 2, 3, and 4 to remove the phrase "the step of" in hopes that this is the phrase that the Examiner considers without an antecedent bases.

CLAIM REJECTIONS – 35 U.S.C. §102

Claims 1-3, 5, 7, 10-11, and 14-16 were rejected under 35 U.S.C. 102(b) as being anticipated by Latasiewicz (US 4,316,235).

In response, Claim 1 has been amended to include a process of tilting the first substrate relative to the second substrate while maintaining the connection between circuits on each of the separated substrates. This tilting element is well supported both in the Drawings and in the Specification. See, for instance, page 12, lines 15-17. This tilting element is entirely missing from Latasiewicz, and, therefore, Latasiewicz cannot support a rejection under 35 U.S.C. 102(b) of the claims as amended.

Moreover, the invention in Latasiewicz is directed to such a different purpose that it is nonanalogous art to the present invention and, in fact, teaches away from the present invention.. Specifically, the problem solved in Latasiewicz relates to moving a portion of a printed wiring board upward in order for luminescent

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diodes on that board to become visible to a human viewing the outside casing of the device (in this case, a clock). As shown in Latasiewicz and explained at column 2, lines 53-60, the invention in Latasiewicz requires that the separated substrates be moved in a parallel, raised fashion relative to each other. In contrast, the subject of the present invention is the art of joining separate printed wiring boards in order to conserve two-dimensional space (typically horizontal foot print) of a circuit board. Tilting of one board relative to another allows more features to be packed into the same footprint of a board. As disclosed in the specification, this tilting is generally accomplished by mounting one board perpendicular to the other, which, by definition, is the maximum "tilting" possible. The invention in Latasiewicz teaches away from such tilting since its goal is simply to raise its diode for better viewing. Any orthogonal tilting would actually move the diodes away from the upper viewing window. Latasiewicz, therefore, teaches away from the present invention.

In sum, Latasiewicz not only fails to teach or disclose the tilting element now included in Claim 1, it is nonanalogous art and teaches away from the present invention. Claim 1 is, therefore, allowable over Latasiewicz. All claims that depend from claim 1 are similarly allowable.

CLAIM REJECTIONS – 35 U.S.C. §103

Claims 4 and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Latasiewicz (US 4,316,235) in view of Degani et al (US 6,370,766). Degani, however, does not teach or disclose the elements of Claim 1, namely, the creation of multiple connected substrates from a common substrate, which multiple substrates remain electrically connected both before and after separation from the common substrate. No disclosure of tilting the connected boards relative to each other is contained in Degani. As a result, Degani's limited teaching related to testing multiple boards while still in situ on a common board does not supply the elements missing from Latasiewicz. Claim 1, therefore, is allowable over both Latasiewicz and Degani and the combination thereof. Since Claim 1 is allowable, both Claims 1 and 20 are allowable.

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Moreover, with respect to claim 20, the external connection for testing taught by Degani is not within the scope of the element of Claim 20 and is irrelevant to Claim 20. Specifically, the external "connection" in Claim 20 is a further limitation upon the "connecting" in the second element of Claim 1. The second element of Claim 1 requires that the connecting be between the first and second circuit patterns, each of which is on the common substrate. Since Degani only involves external connecting with external testing equipment, this is clearly not within the meaning of Claim 20 and is irrelevant.

Claims 8-9 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Latasiewicz (US 4,316,235) in view of Official Notice. Official Notice, of course, does not teach or disclose the elements of Claim 1, namely, the creation of multiple connected substrates from a common substrate, which multiple substrates remain electrically connected both before and after separation from the common substrate. No disclosure of tilting the connected boards relative to each is included within any Official Notice of a method of separating boards. Claim 1, therefore, is allowable over both Latasiewicz and Official Notice of methods of separating boards and the combination thereof. Since Claim 1 is allowable, each of Claims 8-9 and 19 is allowable.

Claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over Latasiewicz (US 4,316,235) in view of Feeney (US 3,780,430). In response, Applicant cannot determine which portion of Feeney teaches holding a substrate in proximity to a sidewall of a cabinet that houses the separated substrates.

Regardless, Feeney does not teach or disclose the elements of Claim 1, namely, the creation of multiple connected substrates from a common substrate, which multiple substrates remain electrically connected both before and after separation from the common substrate. No disclosure of tilting the connected boards relative to each other is contained in Feeney. As a result, Feeney's limited teaching of a method of manufacturing multiple boards while still in situ on a common board does not supply the elements missing from Latasiewicz. Claim 1,

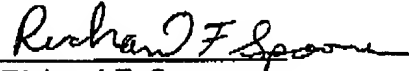
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therefore, is allowable over both Latasiewicz and Feeney and the combination thereof. Since Claim 1 is allowable, each of Claims 8-9 and 19 are allowable.

In sum, Claims 1-5, 7-11 and 14-20 are pending. Each is believed to be in condition for allowance.

In the event the Examiner considers personal contact advantageous to the disposition of this case, the Examiner is hereby authorized to call Applicant's Attorney, Richard Spooner, at Telephone Number (585) 423-5324, Rochester, New York.

Respectfully submitted,



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE:
IN THE SPECIFICATION:**

Amended paragraph on page 10, beginning at line 16:

Turning now to Figure 7, a perspective view of the process step of Figure 6 is shown. As shown, all of the components of both PWB 4 and PWB 5 can be assembled and completed prior to the separating and/or tilting step. Moreover, complete circuit and functional testing of individual boards PWB 4 and PWB 5 can be completed simultaneously, thereby avoiding inventory and handling expenses and problems. [Moreover, because] Such testing is exemplified by testing fixture 60 shown in Figure 5 because connectors 11-14 are already inserted on single substrate board 2 prior to separation or tilting, then the entire PWB assembly of both boards can be completely circuit and functionally tested prior to separation. This is a major advantage over the prior art since, as discussed above, such combined testing normally cannot be completed until after each board is separately manufactured, inventoried, handled, retrieved, and inserted in a socket fixture. Under the prior art, when the combination of boards fails a test, the correction process must both determine whether the defect occurred in the connecting and fixturing process or whether a defect occurred on one of the boards due to mishandling during handling and assembly. In the process of the present invention, testing need occur only once on both the individual and the connected combination of boards.

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Amended paragraph on page 20, beginning at line 2:

[Printed wiring boards are often joined on a motherboard in order to optimize use of cabinet space.]The process of the present invention enables more efficient manufacture and assembly of interconnected [adjoining] printed wiring boards by: [. The steps of the inventive process comprise] forming multiple circuits upon a common substrate before the common substrate is separated into separate boards; making interconnections between the separate boards[, preferably in situ and] before the boards are separated; and separating the common substrate into a plurality of separate interconnected boards. Using the inventive process, interconnections between boards can be fully tested on a single substrate and inventory and handling processes relating to joining of separate boards can be simplified or eliminated.

IN THE CLAIMS:

1) (Amended) An improved process for manufacture and assembly of a plurality of adjoining printed wiring boards, comprising:

(a) forming at least a first circuit pattern and a second circuit pattern on a common substrate;

(b) connecting at least the first circuit pattern to the second circuit pattern; [and]

(c) separating the common substrate into at least a first substrate and a second substrate with the first substrate including the first circuit pattern thereon and the second substrate including the second circuit pattern thereon; and

(d) tilting the first substrate relative to the second substrate while maintaining the connection between the first circuit pattern and the second circuit pattern.

2) (Amended) The process of claim 1, further comprising [the step of] scoring the common substrate along a dividing line.

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3) (Amended) The process of **claim 1**, further comprising [the step] holding the separated substrates in fixed position relative to each other by a holding fixture.

4) (Amended) The process of **claim 1**, further comprising [the step of] testing the connection between the first and second circuit patterns prior to the step of separating the common substrate into separate substrates.